

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte EDWARD F. DOWNS, JR.

Appeal No. 95-3273
Application 08/136,856¹

RECONSIDERATION

Before HAIRSTON, MARTIN, and LEE, Administrative Patent Judges.
MARTIN, Administrative Patent Judge.

ON REQUEST FOR RECONSIDERATION

Appellant has requested reconsideration of our decision dated September 16, 1997, affirming rejections under 35 U.S.C §§ 102(b) and 103 based on Geil and Rokurota.

A. The rejection based on Geil

Our affirmance of the § 102(b) rejection over Geil was based on our conclusions that one skilled in the art would have

¹ Application for patent filed October 18, 1993.

construed the limitation "flat, substantially inflexible substrate" in claim 1 to mean a flat substrate substantially incapable of vibrating in the manner of a piezoelectric diaphragm and that this limitation reads on Geil's flat, aluminum layers 34 and 35 and intermediate damping layer 36. The decision explains that our interpretation is based on the application as a whole, including (1) the discussion of prior art devices that employed films of piezoelectric material as vibrating diaphragms, (2) appellant's description of his substrate as "substantially non-vibrating" (Spec. at 3, line 17), (3) the fact that appellant's device, like Geil's, is intended to operate essentially in a compression mode, and (4) appellant's disclosure that "[t]he microphone can be molded into different shapes since it is a film and can be built into the head liner of a helmet, hat or sweat band" (Spec. at 8, lines 10-12), which we understood to mean that the substrate is flexible enough to be bent from a flat shape to a curved shape conforming to a head liner. Appellant questions our understanding of this sentence, arguing that we incorrectly concluded the substrate is separate from and applied to the head band, when in fact it is the "extremely inflexible material of the helmet itself which is the substrate for the thin film and to which the thin film is attached" (Req.

for Recon. at 1). This argument is unpersuasive for two reasons. The first is that it is at odds with the fact that the term "microphone" is used throughout appellant's specification (e.g., page 3, lines 16-19) to refer to the combination of the piezoelectric sandwich (i.e., piezoelectric film 2 and conductive films 4, 6) and the substrate 8, not to the piezoelectric sandwich alone. Thus, the "molding" step mentioned in the sentence in question refers to the substrate as well as to the piezoelectric sandwich. The argument also fails for the second reason that it does not take into account that the passage in question additionally calls for the microphone to be built into the head liner of a sweat band, which typically is not made of an inflexible material.

Assuming for the sake of argument the sentence in question fails to suggest bending a flat substrate to conform to the shape of a head liner, we would remain of the view that the limitation "substantially inflexible" means the substrate is inflexible enough to be substantially incapable of vibrating (i.e., flexing) in the manner of a piezoelectric diaphragm and that this limitation is satisfied by Geil's aluminum layers 34 and 35 and damping layer 36. While Geil's substrate experiences some dynamic flexing in response to acoustic signals (col. 4,

lines 64-68), this does not take it out of the ambit of claim 1, which due to the presence of the term "substantially" allows some flexing in response to acoustic signals. Furthermore, although Geil, unlike appellant, provides means (i.e., the polarization and wiring schemes of Figures 12A-15C) to cancel out the signal components caused by unwanted flexing, this does not imply that Geil's substrate is more flexible than appellant's disclosed substrate, let alone more flexible than is allowed by claim 1. Appellant's specification leaves open the possibility that his uncompensated output signal includes the undesirable signal components that Geil reduces or eliminates using his compensation techniques. Nor does the fact that Geil's flat substrate can be bent to conform to the curved surface of a boat hull (Fig. 8) imply that it fails to satisfy the "substantially inflexible" requirement of claim 1, i.e., the need to be substantially incapable of vibrating in the manner of a piezoelectric diaphragm in response to incident sound waves. The bending of the substrate to conform to the boat hull is the result of mechanical forces which may be much greater than the flexing or vibrating forces which act on the substrate as a result of incident sound waves.

For the foregoing reasons, we are maintaining our affirmance of the examiner's rejection of claim 1 under § 102(b) as anticipated by Geil.

B. The rejections based on Rokurota

In affirming the § 102(b) rejection of claims 1 and 2 and the § 103 rejection of claims 3-11 over Rokurota, we held that because the term "thin film" is not defined in appellant's specification, the artisan would have construed that term in claim 1 broadly to mean "[a] thin sheet or coating of material," which is the broader of the two definitions given for "film" in McGraw-Hill Electronics Dictionary 208 (1994 ed.). As a result, we held that the claimed "thin film of piezoelectric material" reads on Rokurota's ceramic piezoelectric element 38, which has a thickness of, for example, 0.3 mm (col. 4, lines 54-55). We additionally noted that since 0.3 mm is the same as 0.03 cm, these piezoelectric elements also fall within the following definition of "film" in IEEE Standard Dictionary of Electrical and Electronics Terms 219 (1972 ed.): "(1) (rotating machinery). Sheet having a nominal thickness not greater than 0.030 centimeters and being substantially homogeneous in nature." As evidence that "thin film" would not have been understood to include a layer as thick as 0.3 mm (i.e., 30,000,000 nm),

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appellant has submitted an Internet advertisement by Micro Photonics for a "Thin Film Thickness Probe" that measures film thicknesses between 50 and 20,000 nm, a range that includes appellant's disclosed piezoelectric layer, which has a thickness on the order of 15 microns (i.e., 15,000 nm)(Spec. at 3). Appellant's reliance on this advertisement is misplaced for two reasons, the first being that because it shows an Internet download date of October 1, 1997, it sheds little light on the meaning of "thin film" as of appellant's October 18, 1993, filing date. Second, the advertisement does not purport to define "thin film" or put an upper limit on the thickness of a thin film. Instead, it describes a probe that can measure a particular type of thin film (i.e., a transparent film on a reflective or glass substrate) having a thickness within a particular range (i.e., 50-20,000 nm).

Nevertheless, upon reconsideration of the arguments given in appellant's reply brief, we are persuaded that Rokurota's piezoelectric ceramic layer 38 does not constitute a "thin film" within the meaning of claim 1." Specifically, inasmuch as the only films mentioned in appellant's specification are the prior art piezoelectric film membranes that were stretched tight between two or more attachment points to function

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as diaphragms (Spec. at 2) and the "polyvinylidene fluoride (PVDF) film with a membrane thickness of the order of 15 microns" described by appellant as his preferred (and only specific) embodiment, we agree with appellant that the term "thin film" as used in his claim 1 would have been understood to mean an element which "is, except for its electrical characteristics, about like any sheet of plastic which can be cut with a pair of scissors" (Reply Br. at 3). We note that this interpretation is generally in accord with the following two definitions of "film" (copies enclosed). The first, from The Condensed Chemical Dictionary 383 (1977 ed.), reads in pertinent part as follows:

An extremely thin, continuous sheet of a substance, which may or may not be in contact with a substrate. There is no precise upper limit of thickness, but a reasonable assumption is 0.010 in. [0.25 mm]. . . .

The second is the "Materials" definition of "film" from McGraw-Hill Dictionary of Scientific and Technical Terms 600 (1978 ed.): "[MATER] A thin, flexible, transparent sheet of plastic, adhesive, rubber, or other material" (brackets in original). Accordingly, we will not sustain the rejection of either of claims 1 and 2 under § 102(b) as anticipated by Rokurota or the rejection of any of claims 3-11 under § 103 for obviousness over that reference.

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C. Summary

The request for reconsideration is granted to the extent appellant seeks a reversal of the examiner's rejection of claims 1 and 2 under § 102(b) as anticipated by Rokurota and the rejection of claims 3-11 under § 103 for obviousness over that reference. The request is denied to the extent that appellant seeks a reversal of the examiner's rejection of claim 1 under § 102(b) as anticipated by Geil. Accordingly, the decision of the examiner is affirmed-in-part.

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No time period for taking any subsequent action in
connection with this appeal may be extended under 37 CFR
§ 1.136(a).

AFFIRMED-IN-PART

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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JOHN C. MARTIN)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
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Enclosures